

What is claimed is:

- 1        1.        A method for modifying a database structure, the database being defined at least  
2        partly by commands that define a database schema containing tables with fields that  
3        have attributes, comprising the steps of:  
4                providing a set of schema instructions defining a database structure according to  
5        a preexisting schema;  
6                providing a corresponding set of schema instructions defining the database  
7        according to a modified schema;  
8                parsing the schema instructions for both the preexisting schema and the  
9        modified schema, so as to produce two logical syntax trees wherein the database  
10       structure is defined by at least a subset of structure types and attributes of which at least  
11       one differs between the preexisting schema and the modified schema;  
12                comparing the two logical syntax trees to generate a set of differences between  
13       said structure types and attributes of the subset;  
14                generating from the differences a set of database modification commands for  
15       altering a database according to the preexisting schema, to a database according to the  
16       modified schema, with respect to the structure types and attributes of the subset.
  
- 1        2.        The method according to claim 1, wherein the database structure is defined by  
2        an access and query language that defines tables of variables having labels and field  
3        characteristics.
  
- 1        3.        The method of claim 2, wherein the database structure is defined by ANSI  
2        structured query language (SQL).
  
- 1        4.        The method of claim 2, wherein the database structure is defined by at least one  
2        aspect selected from the group consisting of: association of variable values with a key  
3        variable; association of variable values in at least one table; table name and labeling;  
4        variable name and labeling; aliases; table type; variable type; table dimensions; field  
5        length; variable numeric format; variable string format; identification of key variables;  
6        conditions for uniqueness; conditions for null-ability; and, default values.
  
- 1        5.        The method of claim 2, wherein the schema instructions defining the database  
2        structure according to the preexisting schema are derived from an operational database,

3 and further comprising the step of modifying the operational database by applying the  
4 database modification commands thereto.

1 6. The method of claim 1, further comprising: identifying at least one ambiguity in  
2 said comparing of the two logical syntax trees to generate the set of differences between  
3 said structure types and attributes of the subset; presenting said ambiguity to a user for  
4 resolution; accepting an input from the user for resolving the ambiguity; and wherein  
5 said generating of the database modification commands is at least partly based on said  
6 input from the user.

1 7. The method of claim 6, wherein the set of differences are stored in a log file and  
2 wherein presenting the ambiguity comprises at least one of displaying and sending the  
3 log file to a user.

1 8. The method of claim 6, further comprising recording a log containing a  
2 representation of at least one of said differences and said input from the user.

1 9. The method of claim 6, wherein the ambiguity comprises a choice between one  
2 of at least two alternative database structures that comply with the modified schema.

1 10. The method of claim 6, wherein the ambiguity comprises a choice between one  
2 of at least two alternative modifications to the preexisting schema that proceed toward  
3 the modified schema.

1 11. The method of claim 10, wherein the ambiguity comprises a choice between  
2 renaming at least one of a table and a variable in a table, versus deleting and replacing  
3 at least one of said table and the variable in said table.

1 12. A computer readable medium encoded with computer-executable instructions  
2 for controlling operation of a processor of a printing device to cause the processor to  
3 perform a method comprising:  
4 providing a set of schema instructions defining a database structure according to  
5 a preexisting schema;  
6 providing a corresponding set of schema instructions defining the database  
7 according to a modified schema;

8 parsing the schema instructions for both the preexisting schema and the  
 9 modified schema, so as to produce two logical syntax trees wherein the database  
 10 structure is defined by at least a subset of structure types and attributes of which at least  
 11 one differs between the preexisting schema and the modified schema;

12 comparing the two logical syntax trees to generate a set of differences between  
 13 said structure types and attributes of the subset;

14 generating from the differences a set of database modification commands for  
 15 altering a database according to the preexisting schema, to a database according to the  
 16 modified schema, with respect to the structure types and attributes of the subset.

1 13. The computer readable medium according to claim 12, wherein the database  
 2 structure is defined by an access and query language that defines tables of variables  
 3 having labels and field characteristics, and the database structure is defined to include at  
 4 least one aspect that is changeable with respect to one of: association of variable values  
 5 with a key variable; association of variable values in at least one table; table name and  
 6 labeling; variable name and labeling; aliases; table type; variable type; table  
 7 dimensions; field length; variable numeric format; variable string format; identification  
 8 of key variables; conditions for uniqueness; conditions for null-ability; and, default  
 9 values.

1 14. A dataprocessing system for manipulating a database, comprising at least one  
 2 programmed processor responsive to computer-executable instructions configured for:  
 3 providing a set of schema instructions defining a database structure according to  
 4 a preexisting schema;

5 providing a corresponding set of schema instructions defining the database  
 6 according to a modified schema;

7 parsing the schema instructions for both the preexisting schema and the  
 8 modified schema, so as to produce two logical syntax trees wherein the database  
 9 structure is defined by at least a subset of structure types and attributes of which at least  
 10 one differs between the preexisting schema and the modified schema;

11 comparing the two logical syntax trees to generate a set of differences between  
 12 said structure types and attributes of the subset;

13 generating from the differences a set of database modification commands for  
 14 altering a database according to the preexisting schema, to a database according to the  
 15 modified schema, with respect to the structure types and attributes of the subset.